



**National
Aerospace
Laboratory**

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Title : **EQUILIBRIUM SHAPES OF TETHER
WITH AN AEROSTAT**

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ABSTRACT : Equilibrium studies of the tether have been carried out including the effect of friction drag term in addition to aerodynamic drag and gravity terms. Analytical close-form expression for the tether tension has been derived. The tether-profile shape has been generated by numerically integrating the tether coordinate expressions for the case of a tether supporting an airship. Results have been computed and presented for the SAC 160m³ balloon-tether combination for a range of wind speeds.